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REMARKS

The present Response After Final Office Action Pursuant to 37 CFR 1.116 is submitted in reply to the Final Office Action mailed September 2, 2008 and the Applicant respectfully requests entry of the present Response After Final before reconsideration of the case, and allowance of the present Application or an Advisory Action if the Examiner deems such to be necessary.

Claims 14-22 are presently pending in the Application and the Examiner objects to claim 21 due to an informality therein and rejects claims 14-22 under 35 U.S.C. 112 as indefinite on the grounds stated in the Office Action.

In response, claim 14-22 are amended to address and overcome the grounds for objection to claim 21 and the grounds for rejection of claims 14-22. In view of such amendments, the Applicant accordingly respectfully requests that the Examiner reconsider and withdraw all objections to the claims and all rejections of the claims under 35 U.S.C. 112.

It must be noted that the above amendments to claims 14-22 are fully supported by the specification, the drawings and the claims, as originally filed, and are submitted solely to overcome the stated objections to the claims and the rejections of the claims under 35 U.S.C. 112, and do not added any new subject matter to the invention, the specification or the claims.

Next, claims 14-22 are rejected, under 35 U.S.C. 103, over various combinations of Reynolds `062, Sandig `369 and Loeffler `493. The Applicant acknowledges and respectfully traverses all of the raised obviousness rejections in view of the above amendments and the following remarks.

In brief, the Examiner cites Reynolds `082 as teaching the basic arrangement of gears, input and output shafts and clutches recited in the claims, Sandig `369 as teaching the use of pressure combs to secure the axial positions of the gears, and Loeffler `493 as teaching the use of a double conical roller bearing to support an output shaft. The Applicant respectfully disagrees with and traverses the Examiner's interpretations of the Reynolds `062, Sandig `369 and Loeffler `493 references and the application of the Reynolds `062, Sandig `369 and Loeffler `493 references to claims 14-22 for the following reasons.

As will be discussed in detail below, claims 14-22 of the present Application are patentably distinguished over and from the teachings of Reynolds `062 with regard to the arrangement of shafts, gears and clutches of the claimed rate change transmission under the requirements and provisions of 35 U.S.C. 103. As a consequence, and because the Reynolds `062 reference is the basis for all of the raised rejections of claims 14-22, those claims are

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thereby patentably distinguished over and from all permissible combinations of Reynolds '062, Sandig '369 and Loeffler '493 under the requirements and provisions of 35 U.S.C. 103.

The following discussions will therefore focus on the teachings of Reynolds '062 and the fundamental distinctions of the present invention, as recited in claims 14-22, over Reynolds '062. The following discussions will further focus on the recitations and limitations of independent claims 14, 20 and 22 as well as dependent claims 15 - 19 and 21.

Turning now to the present invention, as recited in claims 14, 20 and 22, as amended herein above and as shown in Fig. 1, the range change transmission of the present invention includes an input shaft 4, an output shaft 22 coaxially aligned with input shaft 4 with a first end of the input shaft 4 being adjacent to a facing first end of the output shaft 22 and first and second countershafts 12, 14 axially parallel to the input shaft 4 and the output shaft 22.

The first and second countershafts 12, 14 each have a first gear wheel 8, 10 located radially adjacent to the input shaft 4 and a second gear wheel 16, 18 located radially adjacent the output shaft 22 and the first and the second countershafts 12, 14 are rotationally engaged with the output shaft 22 through the engagement of the second gear wheels 16, 18 on the first and the second countershafts 12, 14 with an output gearwheel 20 rotationally fixed to the output shaft 22, so that the first and the second countershafts 12, 14 are always rotationally engaged with the output shaft 22.

The input shaft 4 is selectably engagable with either the first and the second countershafts 12, 14 or the output shaft 22, depending upon the axial position of a gearshift sleeve 42 which is mounted on the first end of the input shaft 4, adjacent the facing first end of the output shaft 22, and which is axially moveable but rotationally fixed with respect to the input shaft 4.

Now considering the selectable engagement of the input shaft 4 to the output shaft 22, the first end of the output shaft 22--that is, the end of the output shaft 22 facing the input shaft 4 and gearshift sleeve 42--is formed into inwardly facing teeth 46 that engage with the outwardly facing teeth of the gearshift sleeve 42 when the gearshift sleeve 42 is axially displaced toward the output shaft 22, thereby directly connecting the input shaft 4 with the output shaft 22. It must be noted with respect to teeth 46, the teeth do not comprise a gearwheel, even though teeth 46 are arranged in a circle facing inwards. The teeth 46 instead comprises a toothed clutch mechanism that engages with the gearshift sleeve 42 so that the output shaft 22 is directly driven by the input shaft 4 at the same rotational speed as the input shaft 4.

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Next considering the selectable engagement of input shaft 4 with the first and the second countershafts 12, 14, a loose gear wheel 6 having both radially inner teeth 44 and radially outer teeth 48 is rotatably mounted on the input shaft 4 so that the radially outer teeth 48 of the loose gear wheel 6 are engaged with the first gear wheels 8, 10 of the countershafts 12, 14. The outwardly facing teeth of the gearshift sleeve 42 engage with the radially inner teeth of the loose gear wheel 6 when gearshift sleeve 42 is axially displaced in the direction away from the first end of the input shaft 4--that is, the direction away from the facing end of output shaft 22. The gearshift sleeve 42 thereby rotationally engages the input shaft 4 with the loose gearwheel 6 and thereby to the output shaft 22 through the first gear wheels 8, 10 of the first and the second countershafts 12, 14, the second gearwheels 16, 18 of countershafts 12, 14 and the output gearwheel 20, with the output shaft 22.

In summary, therefore, the mechanism comprising the gearshift sleeve 42, the loose gearwheel 6 and the clutch teeth 46 formed in the end of the output shaft 22 allow the input shaft 4 to be directly engaged with the output shaft 4 through the path comprising the gearshift sleeve 42 and the clutch teeth 46 of the output shaft 22, or indirectly connected with the output shaft 22 through the path comprising the gearshift sleeve 42, the loose gearwheel 6, the first gear wheels 8, 10 and the second gearwheels 16, 18 of the countershafts 12, 14, and the output gearwheel 20.

Turning now to the mechanism described by Reynolds '062, the discussion will focus on the embodiment of the Reynolds '062 transmission illustrated in Fig. 2 and the corresponding portions of the text of the specification as representative of all of the embodiments of the Reynolds '062 described in Reynolds '062. It will also be noted that for purposes of grammatical clarity, the following discussion will, like Reynolds '062, discuss the structure and operation of the Reynolds '062 transmission in terms of the input shaft 12, the output shaft 18 and a single countershaft 16 because any discussion of one countershaft 16 applies equally to the other countershaft 16.

The Reynolds '062 transmission includes an input shaft 12, an output shaft 18 coaxially aligned in end to end relationship with the input shaft 12 and the first and second countershafts 16 axially parallel to the input shaft 12 and the output shaft 18. As shown in Fig. 2 and as described at, for example, column 3, lines 40 - 47, an input gear 14 is rotatable fixed onto the input shaft 12 to rotate with the input shaft 12 and is continuously engaged with a countershaft gear 30 which is rotatable fixed onto countershafts 16. The countershaft 16 thereby rotates continuously with the input shaft 12 at a gear ratio determined by the ratio of the input gear 14 and the countershaft gear 30.

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A plurality of main shaft gears 46 - 58 are rotatably mounted on the output shaft 18 and are in continuous engagement with a corresponding plurality of the countershaft gears 32-40 which are fixedly mounted on the countershaft 16 so that each of the main shaft gears 46-58 thereby rotates continuously with the corresponding one of countershaft gears 32-40 of countershafts 16. A plurality of main shaft clutches 64-70 are splined or otherwise fixedly mounted on the output shaft 18 in association with the main shaft gears 46 - 58 and allow the main shaft gears 46-58 to be selectively engaged with the output shaft 18 so that the output shaft 18 is rotatingly driven by the countershaft 16 at a gear ratio determined by the selected one of main shaft gears 46-48 and the corresponding one of countershaft gears 32-40.

As shown in Fig. 2 and as described in the corresponding portions of the specification, the main shaft clutch 64, which is located at the end of the output shaft 18 adjacent the facing end of the input shaft 12, is selectably engagable with either the mainshaft gear 46, thereby causing the output shaft 18 to be driven by the countershaft 16 through the countershaft gear 32 and the main shaft gear 46, or with the input gear 14 on the input shaft 12, thereby causing the output shaft 18 to be driven directly by the input shaft 12.

It is therefore apparent that there are a number of fundamental differences and distinctions between the present invention, as recited in the pending claims, and the teachings, suggestions, disclosures and/or hints of Reynolds '062. For example, according to Reynolds '062, the transmission input shaft 12 is permanently engaged with the countershaft 16 through the input gear 14 and the countershaft gear 30, so that the input shaft 12 *always drives* the load comprising the countershafts 16, the countershaft gears 32-40 and the main shaft gears 46-48 which, as described above, are permanently engaged with countershaft gears 32-40. Therefore, while the main shaft clutch 64 operates as a selection clutch to either connect the main shaft gear 46 to the countershaft gear 32 or to connect the input shaft 12 directly to the output shaft 18, the main shaft clutch 64 allows the Reynolds '062 transmission only to select whether the input shaft 12 is to drive the load comprising the countershafts 16, the countershaft gears 32-40 and the main shaft gears 46-48 alone or the load comprising the combination of the countershafts 16, the countershaft gears 32-40 and the main shaft gears 46-48 and the output shaft 18.

According to the presently claimed invention, in fundamental difference and distinction from the teachings of Reynolds '062, the mechanism comprising the gearshift sleeve 42, the loose gearwheel 6 and the clutch teeth 46 formed in the end of the output shaft 22 allow the input shaft 4 to be directly engaged with the output shaft 4 through the path comprising the gearshift sleeve 42 and the clutch teeth 46 of the output shaft 22, or indirectly connected with

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the output shaft 22 through the path comprising the gearshift sleeve 42, the loose gearwheel 6, the first gear wheels 8, 10 and the second gearwheels 16, 18 of the countershafts 12, 14, and the output gearwheel 20.

In the present invention as claimed, the gearshift sleeve 42 mechanism allows the input shaft 4 to drive either the load comprising the output shaft 4 or the load comprising the loose gearwheel 6, the first gear wheels 8, 10 and the second gearwheels 16, 18 of the countershafts 12, 14, and the output gearwheel 20—that is, either the output shaft 4 directly or the gear connection to the output shaft 4 through the countershafts 12, 14.

It must be noted that this fundamental difference—between the mechanism and operation of the present invention as recited in the claims and the mechanism and operations taught by Reynolds '062—arises because the present invention as recited in the claims includes the input shaft 4 connection mechanism comprising the gearshift sleeve 42, the loose gearwheel 6 and the clutch teeth 46 formed in the end of the output shaft 22.

It must be further noted in this regard that Reynolds '062 does not teach, suggest, show or even remotely hint at a mechanism comprising a gearshift sleeve 42, a loose gearwheel 6 and clutch teeth 46 formed in the end of an output shaft 22 but instead has a fundamentally and completely different mechanism comprising the input gear 14, the countershaft gear 30 and the main shaft clutch 64, which is incapable of operation in the manner required by the presently claimed invention.

More specifically, it is respectfully submitted that Reynolds '062 does not include, teach or suggest the claimed features of:

“a gearshift sleeve (42), having radially outer teeth (48), being rotationally fixed to and axially slidable along an end of the input shaft (4) between at least first and second positions;”

“a loose gear wheel (6), having radially inner teeth (44) and radially outer teeth, being rotationally supported by the input shaft (4);”

“a drive output shaft (22) being coaxially aligned with the input shaft (4), and the drive output shaft (22) having radially inner teeth (46) at an end located adjacent the input shaft (4);”

or a mechanism wherein

“in the first position of the gearshift sleeve (42), the gearshift sleeve (42) being at least partially located between the input shaft (4) and the loose gear wheel (6) such that the radially outer teeth (48) of the gearshift sleeve (42) engage with the radially inner teeth (44) of the loose gear wheel (6) and the input shaft (4) drives the output shaft (22) via the first and the second counter shafts (12, 14);” and

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"in the second position of the gearshift sleeve (42), the radially outer teeth (48) of the gearshift sleeve (42) engage with the radially inner teeth (46) of the drive output shaft (22) so that the input shaft (4) directly drives the drive output shaft (22) via the gearshift sleeve (42);"

as recited in the pending independent claims.

It is therefore the Applicant's belief and position that, for at least the reasons discussed above, Reynolds '062 does not described, teach, suggest or remotely hint at the present invention as recited in independent claims 14, 20 and 22 to those of ordinary skill in the relevant arts under the requirements and provisions of 35 U.S.C. 103. It is therefore further the Applicant's belief and position that the present invention, as recited in independent claims 14, 20 and 22, is thereby fully and patentably distinguished over and from the teachings of Reynolds '062 under the requirements and provisions of 35 U.S.C. 103.

It must be further noted with respect to the Sandig '369 and Loeffler '493 references, neither Sandig '369 nor the Loeffler '493 in any way teaches, suggests, discloses, remotely hints at or addresses the above described mechanism of the present invention as recited in independent claims 14, 20 and 22. As indicated by the Examiner, Sandig '369 teaches only the use of pressure combs to secure the axial positions of the gears and Loeffler '493 teaches only the use of a double conical roller bearing to support an output shaft. It is therefore apparent that neither Sandig '369 nor Loeffler '493, nor any permissible combination thereof, teaches or suggests a mechanism comprising a gearshift sleeve 42, a loose gearwheel 6 and clutch teeth 46 formed in the end of an output shaft 22. It is therefore apparent that there is no combination of Reynolds '062, Sandig '369 and/or Loeffler '493 that could, or does, teach, suggest, disclose or remotely hints at the presently claimed invention as recited in independent claims 14, 20 and 22 under the requirements and provisions of 35 U.S.C. 103.

It is therefore further the Applicant's belief and position that for the reasons discussed above, the present invention as recited in claims 14, 20 and 22 is thereby fully and patentably distinguished over and from the teachings of Reynolds '062, Sandig '369 and Loeffler '493 and all combinations thereof under the requirements and provisions of 35 U.S.C. 103. The Applicant therefore respectfully requests that the Examiner reconsider and withdraw all rejections of claims 14, 20 and 22, under 35 U.S.C. 103, over Reynolds '062, Sandig '369 and/or Loeffler '493 and all permissible combinations thereof, and allow independent claims 14, 20 and 22.

In addition, and because the above discussed recitations and limitations of claims 14 and 20 are incorporated into dependent claims 15 - 19 and 21, by dependency, it is the Applicant's belief and position that for the reasons discussed above, the present invention as

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recited in claims 15 - 19 and 21 is thereby fully and patentably distinguished over and from the teachings of Reynolds '062, Sandig '369 and/or Loeffler '493 and all combinations thereof under the requirements and provisions of 35 U.S.C. 103. The Applicant therefore respectfully requests that the Examiner reconsider and withdraw all rejections of claims 15-19 and 21 under 35 U.S.C. 103 in view of Reynolds '062, Sandig '369 and/or Loeffler '493.

If any further amendment to this application is believed necessary to advance prosecution and place this case in allowable form, the Examiner is courteously solicited to contact the undersigned representative of the Applicant to discuss the same.

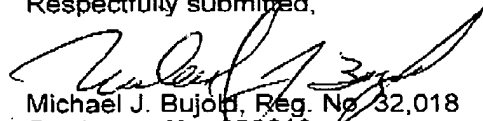
In view of the above amendments and remarks, it is respectfully submitted that all of the raised rejection(s) should be withdrawn at this time. If the Examiner disagrees with the Applicant's view concerning the withdrawal of the outstanding rejection(s) or applicability of the Reynolds '062, Sandig '369 and/or Loeffler '493 references, the Applicant respectfully requests the Examiner to indicate the specific passage or passages, or the drawing or drawings, which contain the necessary teaching, suggestion and/or disclosure required by case law. As such teaching, suggestion and/or disclosure is not present in the applied references, the raised rejection should be withdrawn at this time. Alternatively, if the Examiner is relying on his/her expertise in this field, the Applicant respectfully requests the Examiner to enter an affidavit substantiating the Examiner's position so that suitable contradictory evidence can be entered in this case by the Applicant.

In view of the foregoing, it is respectfully submitted that the raised rejection(s) should be withdrawn and this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

The Applicant respectfully requests that any outstanding objection(s) or requirement(s), as to the form of this application, be held in abeyance until allowable subject matter is indicated for this case.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,



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